

FIG. 1

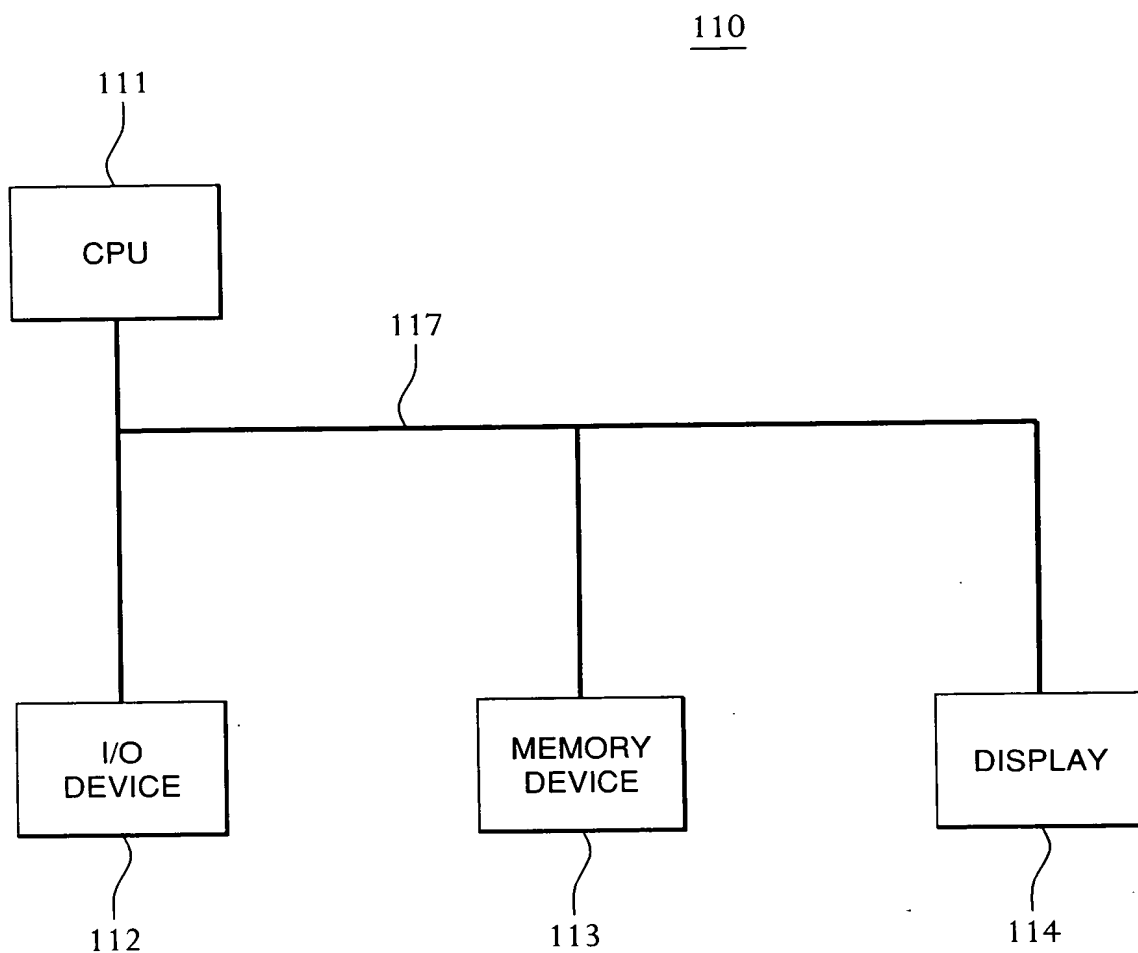


FIG. 2

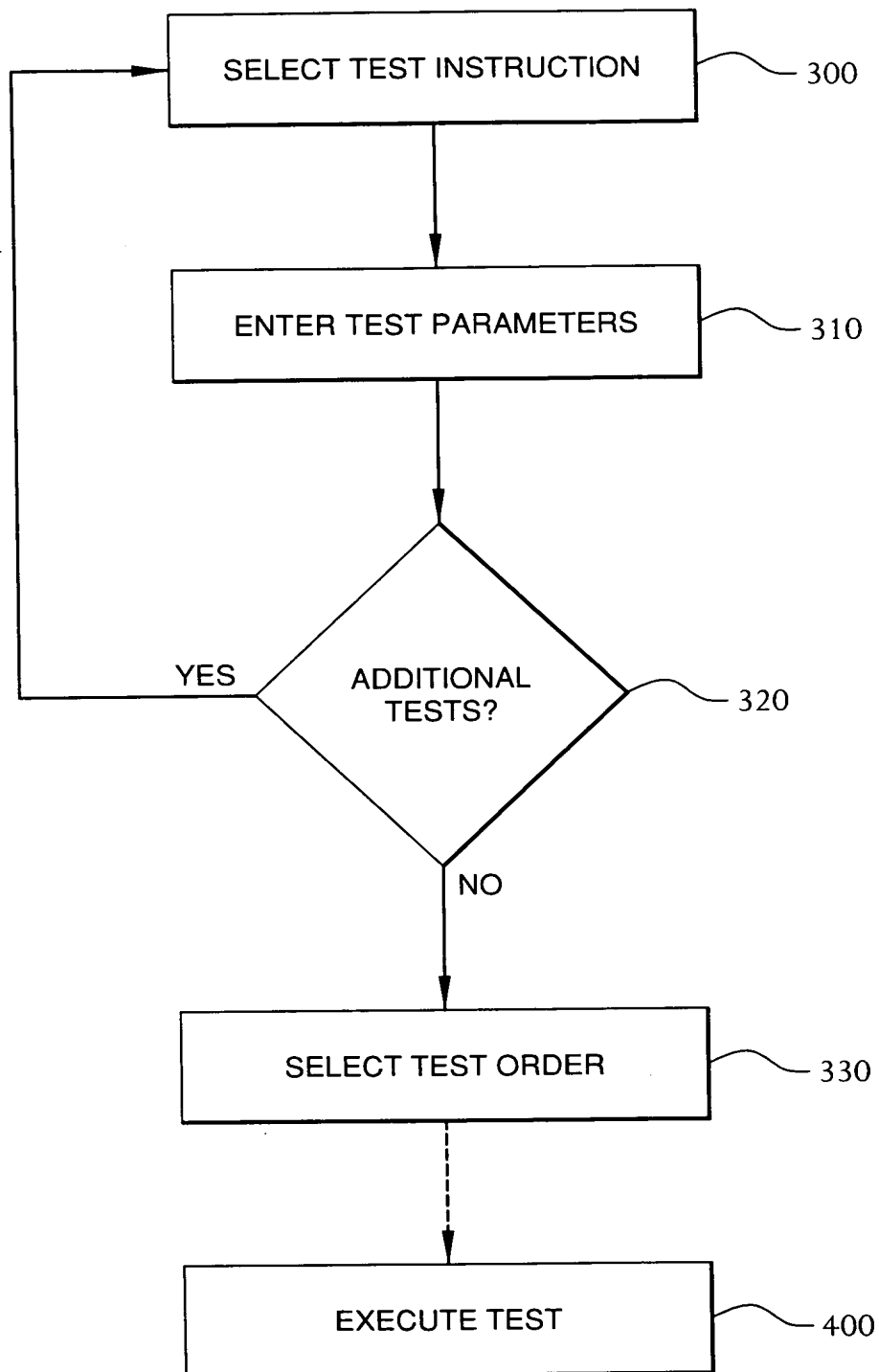


FIG. 3

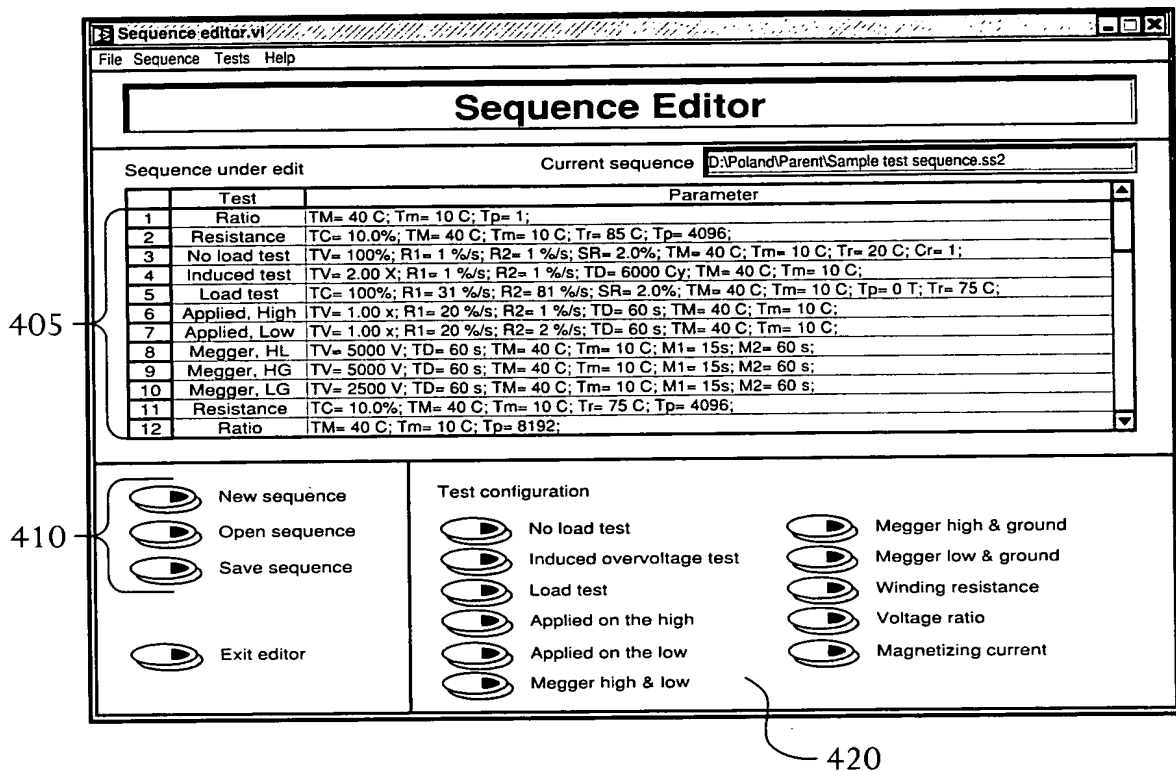


FIG. 4

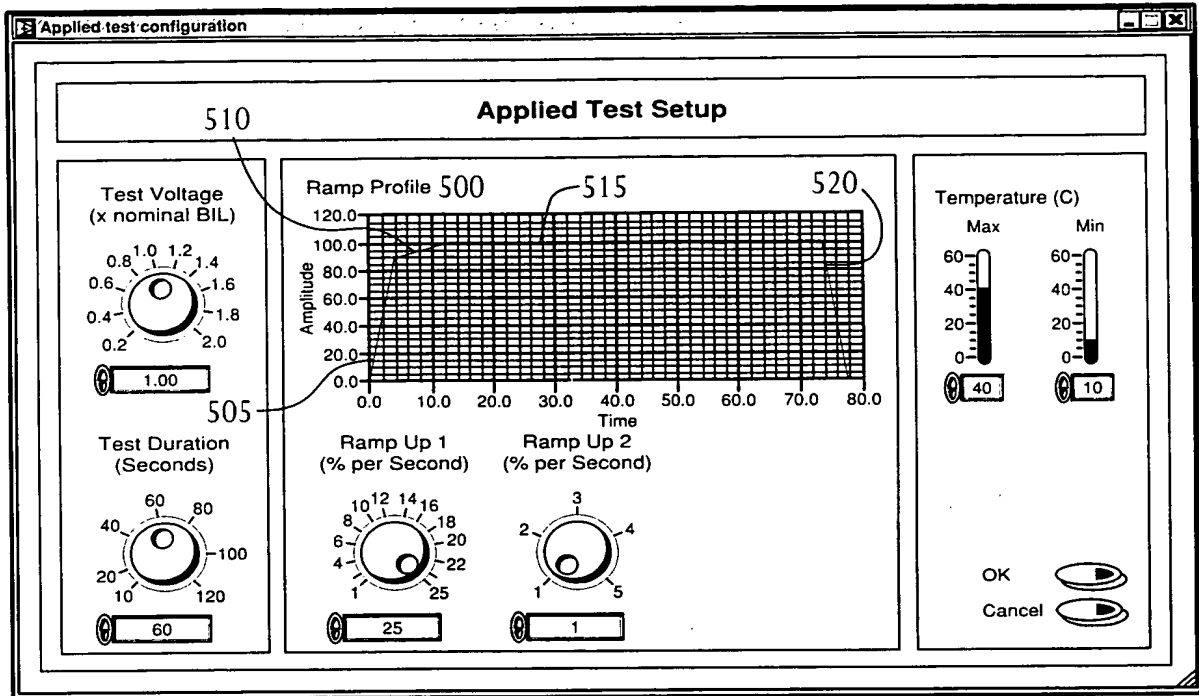


FIG. 5

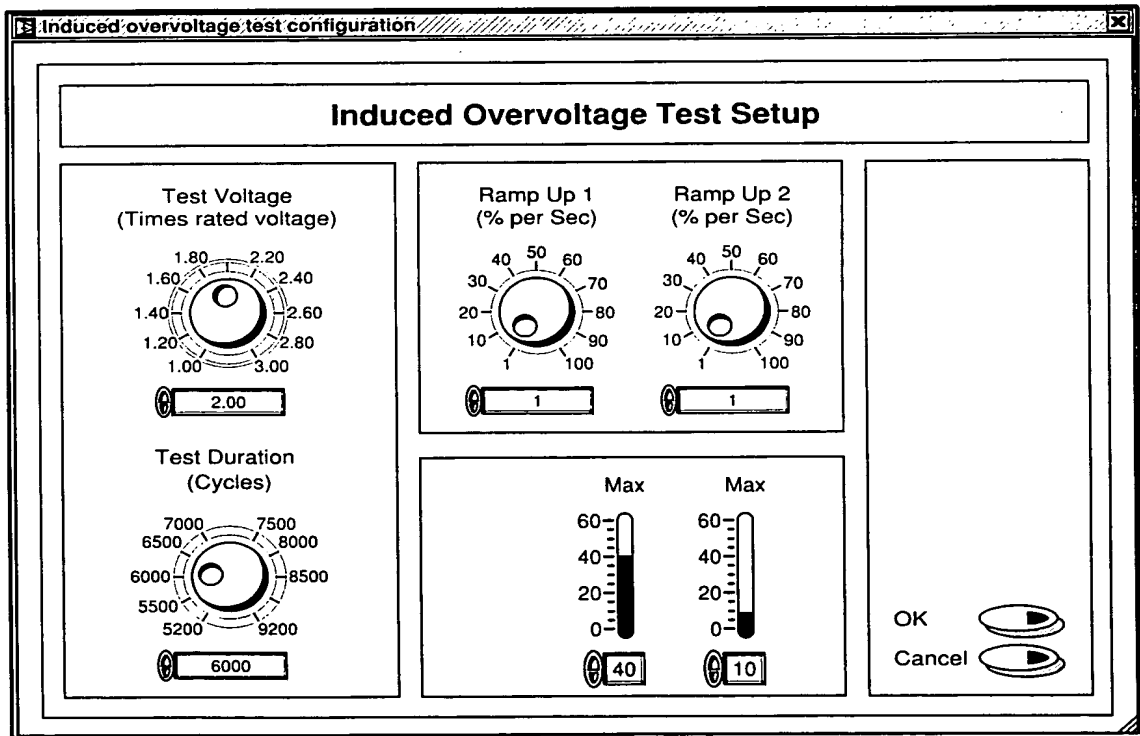


FIG. 6



Load Test Setup

Test Current
(Percent of nominal current)

70 75 80 85 90 95 100
65 60 55 50
100

Stability Current
(Percent of test current)

2.0 2.5 3.0 3.5 4.0 4.5 5.0
1.5 1.0 0.5 0.0
2.0

Ramp Up 1
(% per Sec)

40 50 60 70 80 90 100
30 20 10 1
1

Ramp Up 2
(% per Sec)

40 50 60 70 80 90 100
30 20 10 1
1

Temperature (C)

Max Min
60 60
40 40
20 20
0 0
40 10

Tap
Nominal

T ref
150 100 50 20
75

OK Cancel

FIG. 7

Setup-Mag current.vi

Magnetizing Current

Test Voltage
(V)

200 250 300 350 400 450 500
150 100 50
100

Stability Range
(Percent of test voltage)

2.5 3.0 3.5 4.0 4.5 5.0
2.0 1.5 1.0
2.00

Ramp Up 1
(% per Sec)

40 50 60 70 80 90 100
30 20 10 1
1

Ramp Up 2
(% per Sec)

40 50 60 70 80 90 100
30 20 10 1
1

Max Min
60 60
40 40
20 20
0 0
40 10

OK Cancel

FIG. 8



Megger test configuration

Megger Test

Test Voltage (V)

2000 3000
1000 4000
0 5000

2500

Test Duration (Seconds)

150
100 200
50 250
0 300

60

Measurements

15
60

Time

0

Add ☐

Delete ☐

Temperature (C)

Max Min

60 60
40 40
20 20
0 0

40 10

OK ☐

Cancel ☐

FIG. 9

No load test configuration

No Load Test Setup

Test Voltage (Percent of nominal voltage)

85 90 95
80 100
75 105
70 110

100

Stability Range (Percent of test voltage)

2.5 3.0 3.5
2.0 4.0
1.5 4.5
1.0 5.0

2.00

Ramp Up 1 (% per Sec)

40 50 60
30 70
20 80
10 90
1 100

1

Ramp Up 2 (% per Sec)

40 50 60
30 70
20 80
10 90
1 100

1

Temperature (C)

Max Min

60 60
40 40
20 20
0 0

40 10

☒ Correct?

T ref

150
100
50
0

20

OK ☐

Cancel ☐

FIG. 10



Ratio: test configuration

Ratio Test Setup

Taps Tested

☐ All?

Taps

Nominal

Add

Delete

Max

60
40
20
0

40

Min

60
40
20
0

10

OK

Cancel

FIG. 11

Resistance: test configuration

Resistance Test Setup

Test Current (%)

10.0

T ref

150
100
50
20

75

Temperature (C)

Max

60
40
20
0

40

Min

60
40
20
0

10

Taps Tested

☐ IEC?
☐ All?

Taps

Nominal

Add

Delete

OK

Cancel

FIG. 12



Automated Test

ABB

Hardware Status

CT Tap

All Open

PT Tap

All Open

Megger switch

Visible disconnect

Shorting switch

Resistance H switch

Resistance L switch

Step up tap

No Tap

Output mode

50 Hz TTS

Deck

123

Sw. Network

ErrErrErr

Output energized

Emergency

Error

Test Results

Applied

Mag current

Induced

Megger

Losses

Ratio

Load loss

No load loss

At 100%

Total losses

0.00

Temperature

Tester

Date

Time

Commands

Start

Stop

Reset

Change TUT

Screen

Hardware status

Details

Exit

Test Sequence

%

#

Test

Parameters

1

Ratio

TM= 40 C; Tm= 10 C; TP= 30

2

Resistance

TC= 50 A; TM= 40 C; Tm= 10 C; TP= 40

3

Mag current

TV= 380 V; RU= 1 V/s; AT= 1; SR= 2.0%; TM= 40 C; T

4

Load test

TC= 100 %; RU= 1 V/s; AT= 1; SR= 2.0%; TM= 40 C; T

5

No load test

TV= 105 %; RU= 1 V/s; AT= 1; SR= 2.0%; TM= 40 C; T

6

Megger, HL

TV= 2500 V; TD= 60 s; TM= 40 C; Tm= 10 C; M1= 15 s;

7

Megger, HG

TV= 2000 V; TD= 60 s; TM= 40 C; Tm= 10 C; M1= 15 s;

FIG. 13